

WHAT IS CLAIMED IS:

- 1                   1.     A multi-substrate package comprising:  
2                   a housing;  
3                   a stack of substrates disposed within the housing; and  
4                   an array of connectors including a plurality of channels supported by  
5     the housing, wherein the connectors are movable between extended and retracted  
6     positions within the housing and wherein the connectors connect multiple substrates  
7     in the extended positions of the connectors to communicate the multiple substrates  
8     along the channels.
- 1                   2.     The package as claimed in claim 1, further comprising at least  
2     one actuator for moving the connectors between the extended and retracted  
3     positions.
- 1                   3.     The package as claimed in claim 3, wherein the connectors are  
2     flexible connectors and wherein the at least one actuator flexes the connectors so that  
3     the connectors move between the extended and retracted positions.
- 1                   4.     The package as claimed in claim 1, wherein the channels  
2     include fluid channels and the connectors include fluid connectors.
- 1                   5.     The package as claimed in claim 1, wherein the channels  
2     include electrical channels and the connectors include electrical connectors.
- 1                   6.     The package as claimed in claim 1, further comprising at least  
2     one resilient sheet for separating the multiple substrates and applying a force  
3     between the connectors and the substrates required for proper communication of the  
4     multiple substrates.
- 1                   7.     The package as claimed in claim 6, wherein the housing  
2     includes a cover for applying a force to the stack and wherein the at least one  
3     resilient sheet is compressed by the force to the stack so that the at least one resilient

4 sheet presses terminations of the connectors against terminations on the substrates  
5 and wherein contacts between the connectors and the substrates at the terminations  
6 are pressure contacts.

1 8. The package as claimed in claim 1, wherein the housing  
2 includes side walls and wherein the connectors are formed on the side walls.

1 9. The package as claimed in claim 1, wherein the housing is  
2 rectangular in shape.

1 10. The package as claimed in claim 2, wherein the at least one  
2 actuator includes an electrostatic, magnetic, piezoelectric, or thermal actuator.

1 11. The package as claimed in claim 1, wherein the connectors are  
2 made from Parylene or any other suitable polymer, metal or inorganic dielectric.

1 12. The package as claimed in claim 1, wherein distal ends of the  
2 connectors have terminations formed thereon and wherein the substrates have  
3 terminations which match the terminations of the connectors to form a  
4 connect/disconnect system.

1 13. The package as claimed in claim 1, wherein the housing  
2 includes a plurality of connector substrates which support the connectors.

1 14. The package as claimed in claim 1, further comprising a  
2 sensor supported on a sensor substrate exposed to an environment of the package  
3 and wherein the rest of the substrates are hermetically sealed from the environment  
4 by the housing and the sensor substrate.

1 15. The package as claimed in claim 1, wherein the connectors  
2 permit removal of the substrates from the housing in retracted positions of the  
3 connectors.

1                   16.    The package as claimed in claim 1, further comprising a  
2   battery disposed within the housing for providing electrical power to the substrates.

1                   17.    The package as claimed in claim 1, wherein the connector  
2   array includes at least one flexible cable.

1                   18.    The package as claimed in claim 1, wherein the housing is a  
2   folded housing.

1                   19.    The package as claimed in claim 1, wherein the channels  
2   include fluid and electrical channels and wherein the connectors include fluid and  
3   electrical connectors including the fluid and electrical channels, respectively.

1                   20.    The package as claimed in claim 1, further comprising at least  
2   one MEMS device supported on a MEMS substrate.

1                   21.    The package as claimed in claim 1, wherein the array includes  
2   rows of movable connectors and wherein each row is individually movable.

1                   22.    The package as claimed in claim 1, wherein distal ends of the  
2   connectors are locally adjacent an inner surface of the housing in the retracted  
3   positions to allow both insertion and removal of the substrates from the housing.

1                   23.    A method for assembling a multi-substrate package, the  
2   method comprising:

3                    providing a folded housing and an array of flexible connectors  
4   supported by the housing, the connectors including a plurality of channels;

5                    stacking substrates within the folded housing so that the substrates are  
6   aligned within the folded housing; and

7                    flexing the connectors so that the connectors move between extended  
8   and retracted positions within the folded housing wherein the connectors connect  
9   multiple substrates in the extended positions of the connectors to communicate the  
10   multiple substrates along the channels and wherein the connectors allow the

11 substrates to be stacked in the folded housing in the retracted positions of the  
12 connectors.

1           24.    The method as claimed in claim 23, wherein the step of  
2 providing includes the step of folding a plurality of interconnected substrates to  
3 obtain the folded housing.

1           25.    The method as claimed in claim 23 further comprising placing  
2 a resilient sheet between adjacent stacked substrates for applying a force between the  
3 connectors and the substrates required for proper communication of the adjacent  
4 stacked substrates.

1           26.    The method as claimed in claim 23, wherein a top stacked  
2 substrate has a sensor supported thereon exposed to an environment of the package.

1           27.    The method as claimed in claim 25, wherein the step of  
2 stacking is performed through a top opening in the folded housing and wherein the  
3 method further comprises placing a cover in the top opening to apply a force to the  
4 stack so that the resilient sheet between adjacent stacked substrates is compressed  
5 by the force to the stack so that the resilient sheet presses terminations of the  
6 connectors against terminations on the substrates and wherein contacts between the  
7 connectors and the substrate at the terminations are pressure contacts.